



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,719	01/22/2004	Lap-Tak Andrew Cheng	CL2287USNA	5215
23906 7590 05/25/2007 E I DU PONT DE NEMOURS AND COMPANY LEGAL PATENT RECORDS CENTER BARLEY MILL PLAZA 25/1128 4417 LANCASTER PIKE WILMINGTON, DE 19805			EXAMINER SULLIVAN, CALEEN O	
			ART UNIT 1756	PAPER NUMBER
			MAIL DATE 05/25/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/762,719	<b>Applicant(s)</b> CHENG, LAP-TAK ANDREW	
	<b>Examiner</b> Caleen O. Sullivan	<b>Art Unit</b> 1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) 5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-6 are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>05/13/2004; 01/28/2005</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-4 and 6, drawn to a pattern forming method, classified in class 430, subclass 324.
  - II. Claim 5, drawn to an electronic device, classified in class 257, subclass 40.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the process as claimed can be used to make another or materially different product such as a photomask.
3. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art due to their recognized divergent subject matter, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Attorney John Langworthy on 05/16/2007 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-4 and 6. Affirmation of this election must be made by applicant in replying to this Office action. Claim 5 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Claim Objections***

5. Claims 1, 3-4 and 6 are objected to because of the following informalities: Claim 1 uses the word absence which examiner has interpreted as a misspelling of the word absent. Examiner has used this interpretation in the rejection of the claims that follow. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanda in view of Hayakawa ('782).

Kanda discloses a pattern forming method for making finer space portions. The method consists of first forming a resist pattern on a substrate by depositing a layer of resist capable of generating acid on being irradiated, pre-baking the resist layer, then pattern wise exposing the resist layer with UV rays and then developing the resist layer followed by a post exposure baking step. (See, para 0015-0016). This disclosure meets the limitation of claim 1 where a pattern film of a

Art Unit: 1756

polymer is formed on a substrate, and the limitations of claim 2 where a resist is deposited on a substrate, is masked, is exposed through the mask and then developed. Kanda also discloses that the resist layer can be positive, as recited in claim 2, or negative, and preferred resists includes positive working resists that contain alkali-soluble resins such as novolak resins, hydroxystyrenic resin, or acrylic resin as well as chemically amplified positive or negative resists that generate acid upon irradiation. (See, para 0017). This disclosure meets the limitation of claim 6.

Kanda discloses that after the resist pattern is formed a coating layer forming material is applied to the formed resist pattern before or after irradiating the resist pattern, which meets the limitation of claims 1 and 2, where a film is deposited over the pattern photoresist. (See, para 0028). The acid generated in the resist pattern diffuses into the portion of the coating layer adjacent to the resist pattern layer, which causes a cross linking to occur; therefore, the coating layer adjacent to the resist pattern is made insoluble for a developing solution, which meets the limitation of claim , where the patterned polymer diffuses in the film layer deposited over the patterned layer so the pattern is transferred to the film layer. (See, para 0028). Kanda discloses that to accelerate this diffusion the resist pattern and coating layer are heat treated, with the mixing baking step occurring at about 85°C-150°C for about 60-120 seconds. (See, para 0028). This disclosure meets the limitation of claim 4. Lastly, Kanda discloses the cross linked layer is developed with water a mixture of water and a water miscible organic solvent and an aqueous solution of alkali such as TMAH, which meets the limitation of claims 1 and 2, where excess film layer is removed by exposing to a developer solution. (See, para 0029).

Still, Kanda fails to disclose the limitation of claims 1 and 2, where a thick film paste is deposited over the pattern resist film as well as the limitation of claim 3 where a firing step is

performed on the substrate with the patterned thick film paste. However, Hayakawa ('782) discloses such process steps.

Hayakawa ('782) discloses a method of forming thick film resistor elements by applying a thick-film resistor composition through an image that is formed by exposing, curing and developing a resist layer formed on an insulting substrate according to the resist pattern. (See, abstract).

Hayakawa ('782) discloses that the resist pattern is formed and then the thick film resist composition is filled into the pattern areas where the resist has been developed and removed, which meets the limitation of claims 1 and 2. (See, col.8, 17-44). Hayakawa ('782) then discloses that the thick film resistor composition is dried at a temperature of 80°C-150°C for about 5-15 minutes. (See, col.8, 59-61). Hayakawa ('782) discloses the drying step is followed by a step of sintering the entire structure at a temperature of about 300°C-600°C with the maximum temperature of about 800°C-950°C for about 5-15 minutes, to form the desired resistor layer on the substrate. (See, col.8, 61-col.9, 12). This disclosure meets the limitation of claim 3.

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify the teachings of Kanda in view of Hayakawa ('782), because Hayakawa ('782) teaches that one can form high-precision patterns by coating a thick film paste in a frame formed on a substrate by exposing and developing a resist material layer.

### ***Double Patenting***

9. Claims 1-2 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 of copending Application No. 10/887,364 (US 2005/0032254). Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-3 of Cheng ('254) are fully encompassed by claims 1-2 of the present application.

Art Unit: 1756

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caleen O. Sullivan whose telephone number is 571-272-6569. The examiner can normally be reached Monday- Friday, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/COS/, 05/18/2007



MARK E. HUFF  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700